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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,926	10/27/2003	Guenter W. Brune	DCI-6CIP1D3	5085

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PRITZKAU PATENT GROUP, LLC
993 GAPTER ROAD
BOULDER, CO 80303

EXAMINER

SMITH, MATTHEW J

ART UNIT PAPER NUMBER

3672

DATE MAILED: 10/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/694,926

Applicant(s)

BRUNE ET AL.

Examiner

Matthew J. Smith

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-70 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-70 is/are rejected.
- 7) ☒ Claim(s) 14 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

Information Disclosure Documents

The information disclosure statement filed with this application contains copies of the Information Disclosure Statement (IDS) filed with one of the parent applications (09-845238). The documents cited have been considered but no copy of the IDS is being mailed since the references are initialed by the examiner of record in the parent (09-845238).

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "three antennas" (claim 4) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Figures 4 and 5, "106" should be -106a--.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate

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changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 8-13, 15-20, 22-25, 28, 29 31-34, 38, 39, and 48-50 are rejected under 35 U.S.C. 102(b) as being anticipated by Waters et al (5230387).

Waters et al disclose a system in which a boring tool 22 is moved through the ground, an arrangement for tracking 20, at least two detectors (col. 12, line 34) that transmit and receive electromagnetic location data within a dipole range or signal strength, an antenna array (col. 20, lines 53-55), three orthogonal antennas (col. 8, line 4), processing (col. 11, line 32), producing two subsets of data (col. 12, lines 48-col. 14, line 9), measurement means 141, and a method of use of including moving detectors to new positions (col. 12, lines 54-58)

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Claims 65, and 68-70 are rejected under 35 U.S.C. 102(b) as being anticipated by Flowerdue et al (4812812).

Flowerdue et al. describe steering a boring tool 17 using an electromagnetic locating signal, specifying pitch (col. 5, line 10) via flux lines, means 1-3 for measuring, and the locating signal normal to the flux path line plane approaches zero when to tool is on the proper path (col. 5, lines 1-2).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 40, 41, and 48-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chau et al. (4881083) in view of Waters et al. (5230387).

Chau et al show an above ground receiver for a directional boring system but not two detectors.

Waters et al. disclose the advantages of two detectors and associated analysis in a directional drilling system.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use two detectors in the Chau et al. directional drilling system, as disclosed by Waters et al., in order to increase accuracy.

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Claims 7, 21, 26, 27, and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waters et al. in view of Flowerdue et al.

Waters et al. disclose two detectors in a directional drilling system but not measuring tilt or pitch.

Flowerdue et al describe measuring tilt and pitch of a boring tool in a directional drilling system to assist in guidance of the boring tool.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to measure tilt and pitch of the boring tool, as described by Flowerdue et al. in order to increase accuracy.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Waters et al. in view of Robinson et al. (3725777).

Waters et al. disclose two detectors in a directional drilling system but not using least square error technique.

Robinson et al. discuss using least squares to fit measured data to calculated data (col. 4, line 8) in a well environment.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to use the least square technique, as discussed by Robinson et al., in the Waters et al. system in order to increase accuracy.

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Claims 42-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chau et al. in view of Waters et al. as applied to claim 41 above, and further in view of Flowerdue et al.

Chau et al show an above ground receiver for a directional drilling system but not two detectors. Waters et al. disclose the advantages of two detectors in a directional drilling system. The combination presents using two detectors in the Chau et al. directional drilling system, as disclosed by Waters et al. but not measuring tilt.

Flowerdue et al describe measuring tilt of a boring tool in a directional drilling system to assist in guidance of the boring tool.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to measure tilt, as described by Flowerdue et al., in the combined device in order to increase accuracy.

Allowable Subject Matter

Claims 14 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Smith whose telephone number is 703-305-5135. The examiner can normally be reached on T-F, 9-4.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David J. Bagnell can be reached on 703-308-2151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David Bagnell
Supervisory Patent Examiner
Art Unit 3672

MJS *MJS*
8 September 2004